

Status of the Claims

This listing of claims will replace all prior versions, and listings of claims in the application.

1. (currently amended) A nozzle for an injection molding apparatus, comprising:

a nozzle body including a first threaded portion on an outside surface, said nozzle body defining a nozzle body melt passage, wherein said nozzle body melt passage is adapted to be in fluid communication with an upstream melt source;

a heater, wherein said heater is thermally connected to said nozzle body for heating melt in said nozzle body melt passage;

a tip removably connected to said nozzle body, wherein said tip defines a tip melt passage therethrough, wherein said tip melt passage is downstream from and in fluid communication with said nozzle body melt passage, and is adapted to be upstream from and in fluid communication with a mold cavity in a mold component;

a tip surrounding piece having a second threaded portion on an inside surface, such that the tip surrounding piece is removably connected with respect to said nozzle body through mating of the first and second threaded portions, wherein said tip surrounding piece is spaced from said tip; and

a seal piece positioned between said tip and said tip surrounding piece, wherein said seal piece forms a seal with the tip and with the tip surrounding piece to inhibit melt leakage between the seal piece and the tip and between the seal piece and the tip surrounding piece, so that, in use, at least a portion of said tip and at least a portion of said tip surrounding piece are separated by an air gap.

2. (currently amended) A nozzle as claimed in claim 23 1, wherein the thermal conductivity of said seal piece is less than the thermal conductivity of said tip.

3. (currently amended) A nozzle as claimed in claim 23 ~~4~~, wherein the thermal conductivity of said tip surrounding piece is less than the thermal conductivity of said tip.

4. (currently amended) A nozzle as claimed in claim 23 ~~4~~, wherein said tip surrounding piece is configured to contact said mold component.

5. (original) A nozzle as claimed in claim 4, wherein said tip surrounding piece is made of a material that inhibits heat transfer between said nozzle and said mold component.

6. (currently amended) A nozzle as claimed in claim 23 ~~4~~, wherein said tip surrounding piece is configured to cooperate with said mold component to seal against melt leakage therebetween.

7. (currently amended) A nozzle as claimed in claim 23 ~~4~~, wherein said tip has a first threaded portion for mating with a corresponding second threaded portion on said nozzle body

8. (original) A nozzle as claimed in claim 7, wherein said tip surrounding piece has a third threaded portion for mating with a corresponding fourth threaded portion on said nozzle body.

9. (currently amended) A nozzle as claimed in claim 23 ~~4~~, wherein said tip surrounding piece retains said tip in place through said seal piece.

10. (currently amended) A nozzle as claimed in claim 23 ~~4~~, wherein said tip surrounding piece is configured to align said nozzle with respect to a gate into said mold cavity in said mold component.

11. (currently amended) A nozzle as claimed in claim 23 ~~+~~, further comprising an insulator piece, wherein said insulator piece is connected to said nozzle body and said tip surrounding piece is connected to said insulator piece.

12. (currently amended) A nozzle as claimed in claim 23 ~~+~~, further comprising a fourth piece, wherein said fourth piece is connected to said nozzle body and said tip surrounding piece is connected to said fourth piece and wherein said fourth piece has a lower thermal conductivity than the thermal conductivity of said tip surrounding piece.

13. (currently amended) A nozzle as claimed in claim 23 ~~+~~, wherein the seal piece is positioned proximate the gate-facing end of at least one of the tip and the tip surrounding piece.

14. (currently amended) A nozzle for an injection molding apparatus, comprising:

a nozzle body, said nozzle body defining a nozzle body melt passage, wherein said nozzle body melt passage is adapted to be in fluid communication with an upstream melt source, the nozzle body including a bore having a same bore diameter along its length;

a heater, wherein said heater is thermally connected to said nozzle body for heating melt in said nozzle body melt passage;

a tip having a first portion with a same first portion diameter along its length, wherein that the first portion diameter is substantially the same as the bore diameter so that the first portion is received within the bore, wherein the tip is removably connected to said nozzle body, wherein said tip defines a tip melt passage therethrough, wherein said tip melt passage is downstream from and in fluid communication with said nozzle body melt passage, and is adapted to be upstream from and in fluid communication with a mold cavity in a mold component;

a tip surrounding piece removably connected with respect to said nozzle body, wherein at least a portion of said tip and at least a portion of said tip surrounding piece are separated by an air gap ~~, wherein said tip surrounding piece is free of contact with~~

~~said tip, and wherein said tip surrounding piece and said tip are spaced from each other by a gap; and~~

a seal piece positioned between said tip and said tip surrounding piece, wherein said seal piece seals against both said tip and said tip surrounding piece to inhibit leakage of melt therepast into at least a portion of said gap.

15. (original) A nozzle as claimed in claim 14, wherein the thermal conductivity of said seal piece is less than the thermal conductivity of said tip.

16. (original) A nozzle as claimed in claim 14, wherein said tip has a first threaded portion for mating with a corresponding second threaded portion on said nozzle body.

17. (original) A nozzle as claimed in claim 16, wherein said tip surrounding piece has a third threaded portion for mating with a corresponding fourth threaded portion on said nozzle body.

18. (original) A nozzle as claimed in claim 14, wherein said tip is removably connected to said nozzle body.

19. (original) A nozzle as claimed in claim 14, wherein said tip surrounding piece retains said tip in place through said seal piece.

20. (original) A nozzle as claimed in claim 14, wherein said tip surrounding piece is configured to align said nozzle with respect to a gate into said mold cavity in said mold component.

21. (original) A nozzle as claimed in claim 14, wherein said tip surrounding piece is configured to cooperate with said mold component to seal against melt leakage therebetween.

22. (original) A nozzle as claimed in claim 14, wherein the seal piece is positioned proximate the gate-facing end of at least one of the tip and the tip surrounding piece.

23. (currently amended) A nozzle for an injection molding apparatus, comprising:

- a nozzle body, said nozzle body defining a nozzle body melt passage, wherein said nozzle body melt passage is adapted to be in fluid communication with an upstream melt source;

- a heater, wherein said heater is thermally connected to said nozzle body for heating melt in said nozzle body melt passage;

- a tip, wherein said tip removably contacts said nozzle body, wherein said tip defines a tip melt passage therethrough, wherein said tip melt passage is downstream from and in fluid communication with said nozzle body melt passage, and is adapted to be upstream from and in fluid communication with a mold cavity in a mold component;

- a tip surrounding piece removably connected with respect to said nozzle body, wherein said tip surrounding piece is free of contact with said tip, and wherein said tip surrounding piece and said tip are spaced from each other by a gap; and

- a seal piece positioned between said tip and said tip surrounding piece, wherein said seal piece forms a seal with the tip and with the tip surrounding piece to inhibit melt leakage between the seal piece and the tip and between the seal piece and the tip surrounding piece, so that, in use, at least a portion of said tip and at least a portion of said tip surrounding piece are separated by an air gap, ~~and wherein said tip surrounding piece retains said tip in place through said seal piece.~~

24. (new) A nozzle as claimed in claim 1, wherein said tip surrounding piece retains said tip in place through said seal piece.